

**AMENDMENT**

**Please amend the claims as follows:**

1. (currently amended) An ultrasound probe for connection with an imaging system, the probe comprising:

an ultrasound transducer;

a releasable connector electrically connected with the ultrasound transducer and releasably connectable with an ultrasound imaging system, the releasable connector having a plurality of electrical outputs for respective signals each representing one or more different elements; ~~and~~

an analog-to-digital converter connected between the ultrasound transducer and the releasable connector and separate from ~~an~~ the ultrasound imaging system and an imaging system housing;

a cable electrically connecting the ultrasound transducer to the analog-to-digital converter; and

a connector housing connected with an end of the cable and at least partially around the releasable connector and the analog-to-digital converter, the housing spaced from the ultrasound transducer.

2. (original) The probe of Claim 1 wherein the ultrasound transducer comprises a multi-dimensional array of elements.

3. (cancelled)

4. (currently amended) The probe of Claim 1 wherein the ultrasound transducer array comprises a plurality of transducer elements, the analog-to-digital converter electrically connected with at least a first element of the plurality of transducer elements;

further comprising a plurality of analog-to-digital converters, the plurality of analog-to-digital converters including the analog-to-digital converter electrically connected with the

first element, the plurality of analog-to-digital converters electrically connected with different ones of the plurality of transducer elements.

5. (original) The probe of Claim 4 further comprising:

a plurality of cables electrically connecting the plurality of transducer elements to the respectively plurality of analog-to-digital converters, the plurality of cables being fewer than the plurality of transducer elements; and

a multiplexer electrically connected between the plurality of cables and the plurality of transducer elements.

6. (currently amended) The probe of Claim 1 further comprising:

a summer connected with the analog-to-digital converter, the summer operable to combine signals from at least two elements of the ultrasound transducer-array, the combined signal output on one of the plurality of electrical outputs as a signal representing one of the different elements.

7. (currently amended) The probe of Claim 1 further comprising a partial beamformer operable to combine data from elements of the ultrasound transducer-array and output the combined data on respective ones of the plurality of electrical outputs.

8. (original) The probe of Claim 1 further comprising:

a digital processor connected between the analog-to-digital converter and one of the plurality of electrical outputs.

9. (currently amended) The probe of Claim 1 further comprising:

a switch connected between the ultrasound transducer-array and the analog-to-digital converter, the switch operable to bypass analog signals to one of the plurality of electrical outputs.

10. (original) The probe of Claim 1 further comprising:

a demultiplexer connected with the analog-to-digital converter; and  
a serializer connected with the demultiplexer and at least one of the plurality of electrical outputs.

11. (original) A system for communicating signals from a transducer for imaging, the system comprising:

a processing system comprising:

at least a part of a receive beamformer;

a system housing; and

a connector on the system housing, the connector electrically connectable with the receive beamformer; and

a detachable transducer assembly comprising:

a transducer probe at least partially housing an array of elements;

a connector housing at least partially housing an analog-to-digital converter, the connector housing physically connectable and detachable from the connector on the system housing; and

at least one cable connecting the transducer probe with the connector housing.

12. (original) The system of Claim 11 wherein the transducer probe is a handheld probe.

13. (original) The system of Claim 11 wherein:

the transducer probe further houses a multiplexer connected with a plurality of the elements of the array, the multiplexer operable to multiplex signals from the plurality of elements to an output; and

the connector housing further housing a demultiplexer.

14. (original) The system of Claim 11 wherein the connector housing further houses a serializer connected with the analog-to-digital converter.

15. (original) The system of Claim 11 wherein the connector housing further houses a processor, the processor operable to compress digital data responsive to output by the analog-to-digital converter.

16. (original) An ultrasound probe for connection with an imaging system, the probe comprising:

an ultrasound transducer;

a releasable connector electrically connected with the ultrasound transducer and releasably connectable with an ultrasound imaging system, the releasable connector having a plurality of electrical outputs for respective signals representing different elements; and

a processor connected between the ultrasound transducer and the releasable connector, the processor in a housing of the releasable connector and operable to compress signals from the ultrasound transducer.

17. (original) The probe of Claim 16 further comprising an analog-to-digital converter between the transducer and the processor, the processor comprising a digital processor.

18. (original) The probe of Claim 16 further comprising a cable between the housing and the ultrasound transducer.

19. (original) The probe of Claim 16 wherein the processor is operable to compress signals by partial beamforming.

20. (currently amended) A method for communicating signals from a transducer array to an imaging system, the method comprising:

- (a) releasably connecting a probe assembly to an imaging system;
- (b) transducing acoustic energy into electrical signals;
- (c) transmitting the electrical signals to an analog-to-digital converter;
- (d) converting the electrical signals into digital data within the probe assembly;

and

(e) passing the digital data from the probe assembly to at least a part of a beamformer of the imaging system;

wherein (c) comprises transmitting the electrical signals through a cable of the probe assembly, and wherein (d) comprises converting the electrical signals into digital data within a connector housing of the probe assembly.

21. (cancelled)

22. (original) The method of Claim 20 further comprising:

(f) compressing the digital data prior to (e).

23. (original) The method of Claim 20 further comprising:

(f) time division multiplexing the electrical signals prior to (c); and

(g) demultiplexing the digital data after (d) and before (e).

24. (currently amended) The probe of Claim [[3]]1 wherein transducer cables within the cable each have a constant length and same impedance.